Operating Instructions

TX

English version of operating instructions for operators.
Read and follow the instructions and safety instructions!
Subject to technical change.

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Dear customer,

Congratulations on choosing a quality product from FRÖLING.

The FRÖLING TX wood chip boiler features a state-of-the-art design that conforms to all currently applicable standards and testing guidelines.

Please read and observe the operating instructions and always keep them close to the boiler for reference. They contain safety information and all the operation and maintenance specifications needed to operate the boiler safely, properly and economically.

The constant further development of our products means that the pictures and content may differ slightly. If you discover any errors, please let us know. Subject to technical change.

Guarantee conditions

Our sale and delivery conditions generally apply. These conditions have been made available to customers, and customers have been made aware of them at the time of order completion.

You can also find the guarantee conditions on the enclosed guarantee certificate.

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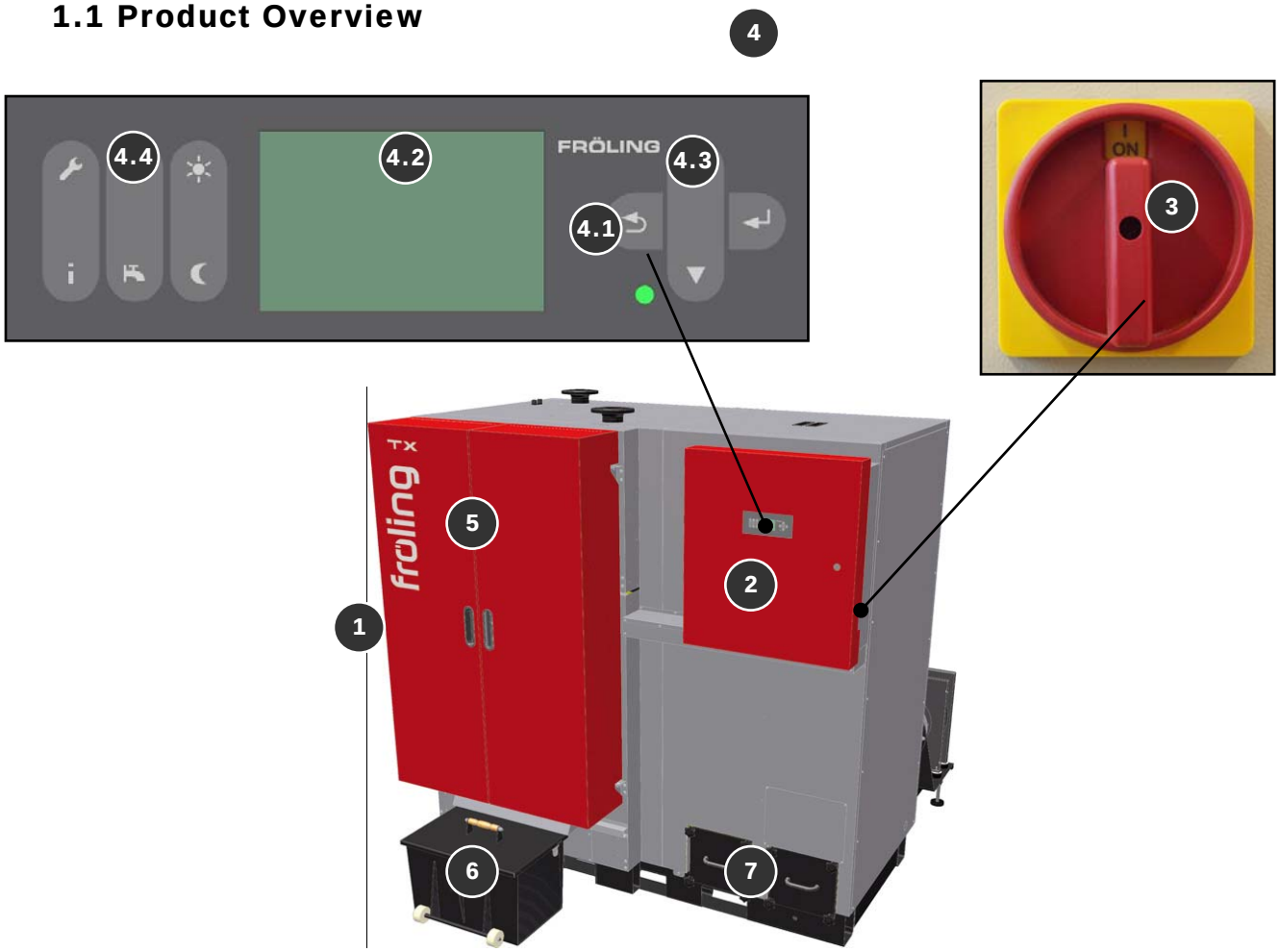
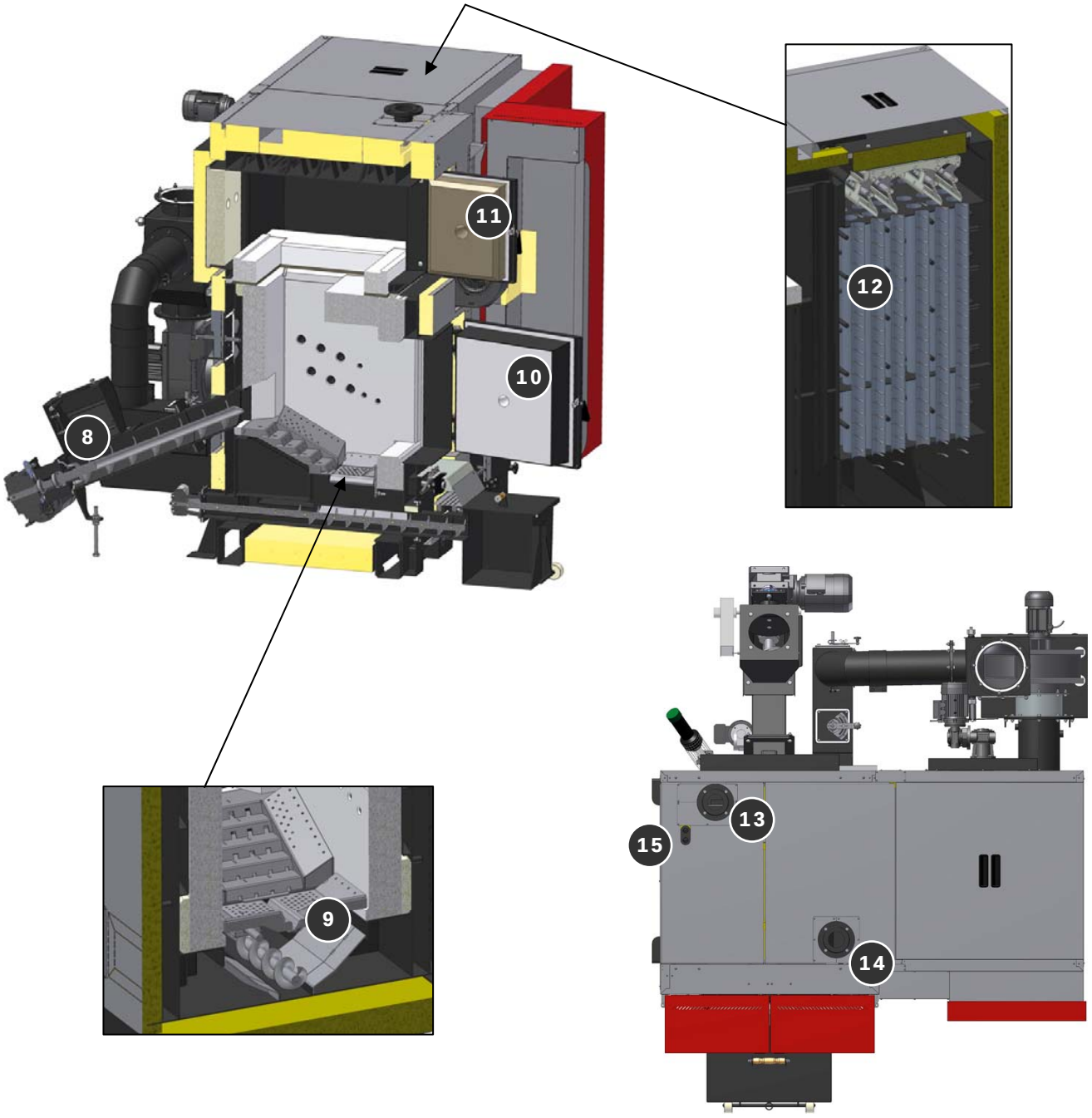
1 General

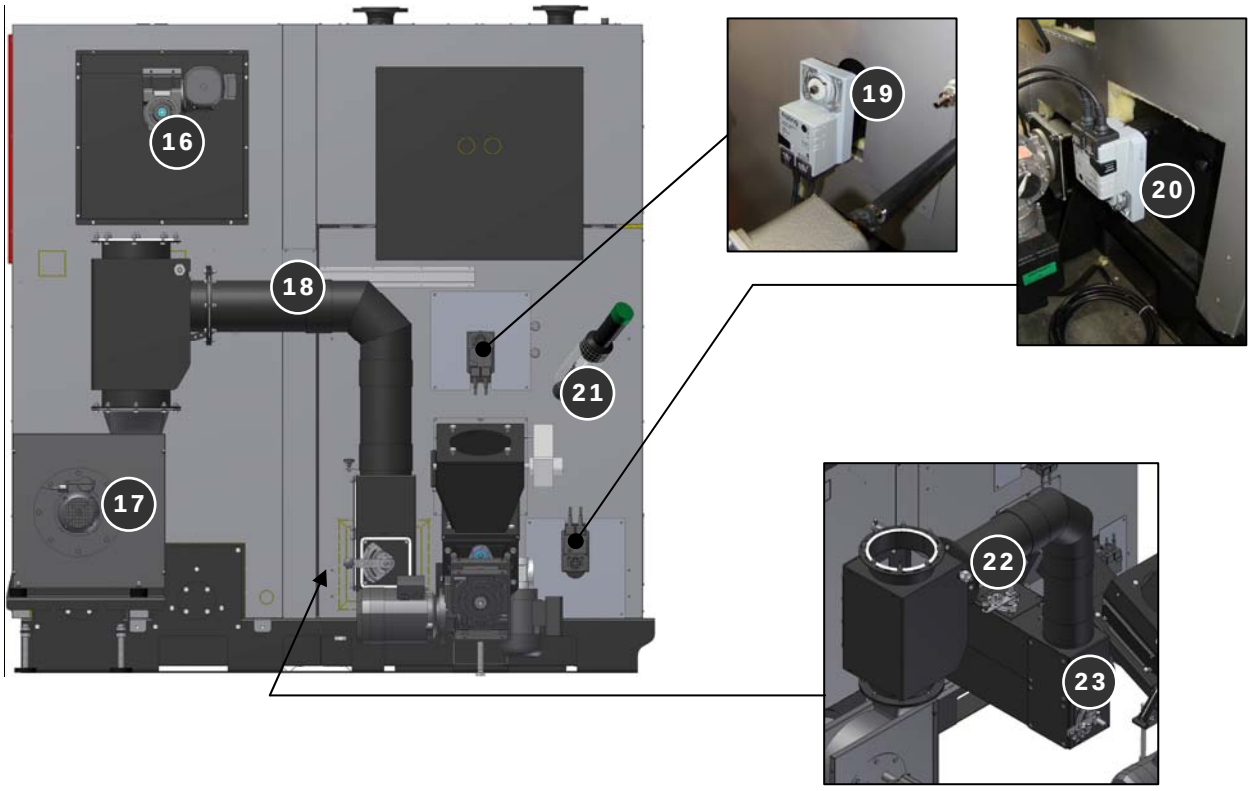
1.1 Product Overview



Pos.	Description	Symb.
1	Wood chip boiler - Fröling TX	
2	Switch cabinet with integrated Lambdatronic H 3200 controller	
3	Main switch: switch the power supply on and off for the entire system	
4	Control panel of the Lambdatronic H 3200 controller	
4.1	Status LED (operating status): - slow green flashing light: boiler activated - fast green flashing light: boiler deactivated - red flashing light: Fault	
4.2	Large graphical display to show operating statuses and parameters	
4.3	Navigation keys to move around in the menus and to change the parameter values	
4.4	Function keys for calling up individual boiler functions or modes directly	
5	Insulated door	
6	Automatic ash removal ashcan	
7	Ash removal unit or second ash box with automatic heat exchanger ash removal	



Pos.	Description	Symb.
8	Fuel transport unit with top gravity shaft, burn back flap or rotary valve as a burn back protection system and stoker screw for fuel transport	
9	Automatic tipping grate	
10	Combustion chamber door	
11	Heat exchanger door	
12	Efficiency Optimisation System (WOS) with turbulators	
13	Boiler outfeed connection	
14	Boiler return connection	
15	Thermal discharge safety device connection	



Pos.	Description	Symb.
16	Automatic drive for heat exchanger cleaning	
17	Induced draught fan	
18	Flue gas recirculation (optional)	
19	Secondary air control with actuator drive	
20	Primary air control with actuator drive	
21	Automatic ignition	
22	Flue gas recirculation for step grate	
23	Flue gas recirculation for tipping grate	

2 Safety

2.1 Safety Information

DANGER

Non-permitted use!

Incorrect use of the boiler can cause severe injuries and damage!

The instructions and information provided in the instructions should be observed!

Details on procedure for operation, maintenance and cleaning, as well as troubleshooting for the boiler are included in the individual instructions. Any further work should be carried out by authorised heating engineers or by Fröling customer services.

WARNING

External influences!

Negative external influences, such as insufficient combustion air or a fuel that is not permitted can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases or flash fires) which can in turn cause serious accidents!

Instructions and information for versions and minimum values, as well as standards and guidelines for heating components in the instructions must be observed!

WARNING

Severe injuries and damage can be caused by an inadequate flue gas system!

Problems with the flue system, such as poor cleaning of the flue pipe or insufficient chimney draught can cause serious faults in combustion (such as spontaneous combustion of carbonisation gases or flash fires)!

You can only be guaranteed of optimum performance from the boiler if the flue gas system is running smoothly!

2.2 Permitted uses

The boiler should only be operated when it is in full working order. It should be operated in accordance with the instructions, observing safety precautions, and you should ensure you are aware of the potential hazards. Ensure that any faults, which might impair safety, are rectified immediately.

The TX series wood chip boiler is intended exclusively for heating central heating water. Use only the fuels specified under 2.2.1.

The manufacturer or supplier is not liable for any damages resulting from non-permitted uses.

2.2.1 Permitted fuels

Wood chips

	Designation as per		Description as per ÖNORM M 7133
	ÖNORM M 7133	ÖNORM/DIN CEN/TS 14961	
Water content	**W20**	**M20**	Air dried
	W30	**M30**	Suitable for storage
Size	**G30**	**P16**	Fine wood chips
	G50	**P45**	Medium wood chips

Applicable standards:

§

Austria: ÖNORM M 7133 or ÖNORM CEN/TS 14961

Germany: Wood chips in accordance with §3 (1) point 4 of the 1st BImSchV in the applicable version.

Specifications as per DIN CEN/TS 14961 and/or ÖNORM M 7133

Pellets

Wood pellets made from natural wood with a diameter of 6 - 10 mm

Applicable standards:

§

Austria: ÖNORM M 7135 - HP 1 and/or DINplus certification program

Germany: DIN 51731 - HP 5, DINplus certification program and/or ÖNORM M 7135 - HP 1

Generally applicable:

Before refilling the store, check for pellet dust and clean if necessary.

Changing the fuel

⚠ CAUTION

Incorrectly set fuel parameters:

Incorrect parameter settings have a significant effect on the functioning of the boiler, and as a result this will void the guarantee.

If the fuel is changed (e.g. from wood chips to pellets), the system must be reset by Fröling customer services.

2.2.2 Non-permitted fuels

⚠ CAUTION

Use of non-permitted fuels:

Burning non-permitted fuels leads to a build-up of aggressive sedimentation and condensation, which can lead to damage to the boiler and also voids the warranty!

All fuels not defined under 2.1.1 are considered non-permitted. Due to various air-quality protection regulations, non-permitted fuels include:

- Chipboard waste, treated wood-wastes, pure grinding dust,
- Refuse, large quantities of paper, cardboard packaging, ...
- Coal (brown coal, anthracite coal, briquettes...)

2.3 Qualification of operating staff

Only trained operators are permitted to operate the boiler. The operator must also have read and understood the instructions in the documentation.

⚠ CAUTION

If unauthorised persons enter the boiler room:

Risk of injury and damage to equipment!

It is the responsibility of the operator to ensure that unauthorised persons, especially children, are kept away from the boiler.

2.4 Protective equipment for operating staff

You must ensure that staff have the protective equipment specified by accident prevention regulations.

- During operation, inspection and cleaning of the boiler:
  - Sturdy shoes
  - protective gloves

2.5 Design Information

It is forbidden to carry out modifications to the boiler or to change or deactivate safety equipment.

Always comply with all fire, building, and electrical regulations when installing or operating the boiler system, and follow the operating instructions and mandatory regulations that apply in the country in which the boiler is operated.

2.5.1 Official approval and obligation to report

NOTICE

Each heating system must be officially authorised.

The appropriate supervisory authority (inspection agency) must always be informed when a heating system is installed or modified, and authorisation must be obtained from the building authorities.

Austria:	Report to the construction authorities of the community or magistrate
Germany:	Report new installations to an approved chimney sweeper and to the building authorities.
Other countries:	Observe local regulations for authorisation

2.5.2 Requirements for heating water

The requirements for heating water are based on the following standards:

Applicable standards:

§

Austria:	ÖNORM H 5195-1
Germany:	VDI 2035
Switzerland:	SWKI 97-1

If the system is topped up or refilled:

Prepare (soften) the water to prevent boiler scaling.

2.5.3 Ventilation of boiler room

The openings for the supply air and the exhaust air should be arranged as close to opposite each other as possible to achieve a good thermal draught effect.

☞ Draw in the supply air directly from outside. Expel the exhaust air directly outside.

Provided they are not contradicted by the relevant building regulations room where the boiler is to be installed, the following standards apply:

Applicable standards:

§

- TRVB H 118
- ÖNORM H 5170

Provide a supply air cross-section of 2 cm^2 per kW of boiler rated output, as per ÖNORM H 5170, but a total cross-section of at least 200 cm^2

2.5.4 Heating System Installation / Standards

The following standards govern the installation of heating systems:

Applicable standards:

§

ÖNORM / DIN EN 12828 Heating Systems in Buildings

Storage tank

NOTICE

A storage tank with the proper dimensions will guarantee the best boiler operating values during the entire heating period.

Please contact your installer or Fröling directly for the right measurements for the storage tank.

Return lift

If the hot water return is below the minimum return temperature, some of the hot water outfeed will be mixed in.

⚠ CAUTION

Risk of dropping below dew point / condensation formation if operated without return lift.

Condensation water forms an aggressive condensate when combined with combustion residue, leading to damage to the boiler.

Regulations stipulate the use of a return lift.

2.6 Safety devices

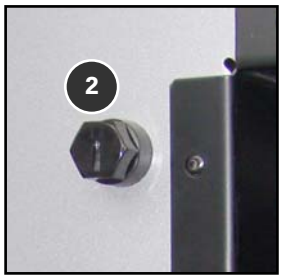
1	Automatic operation button	If the boiler overheats: ❒ Press and hold this button for 5 seconds ➥ Automatic operation is switched off and the controller follows the boiler shutdown procedure ☞ **The pumps continue to run!** ☞ **Never use the main switch!**
2	Safety temperature limiter (back of boiler)	➲ Page 14, Devices for preventing the boiler from overheating
3	Main switch	For shutting down the entire system: ☞ Only switch off the main switch when the boiler has cooled down and the controller is switched off (“Boiler off” status). ❒ Turn the main switch to the “O” position ➥ The power to all components is switched off.
Not shown	Water sprinkler system	In case of burn back, the valve of the water sprinkler system opens and water goes into the gravity shaft as well as the duct of the feed screw. ☞ This need only be connected when specified by the authorities.

2.6.1 Devices for preventing the boiler from overheating

Thermal discharge safety device

At around 100 °C a valve opens and sends cold water to the safety heat-exchanger to decrease the temperature.

Safety Temperature Limiter STL



Stops combustion at a max. boiler temperature of 105 °C. The pumps continue to run.

☞ Once the temperature has fallen below the unlocking point (approx. 95 °C), the safety temperature limiter (2) can be unlocked mechanically.

Safety valve (provided by the customer)

Protection against over-heating/ excessive pressure:

When the boiler pressure reaches a maximum of 3 bar, the safety valve opens and the heating water is released in the form of steam.

2.7 Safety information for installation room

- Danger of fire due to flammable materials. No flammable materials should be stored near the boiler.
- Damage due to impurities in combustion air. Do not use any solvents or cleaning agents containing chlorine in the room where the boiler is installed.
- Keep the air suction opening of the boiler free of dust.
- The room where the boiler is installed must be frost-proof.

2.8 Residual risks

WARNING

Touching hot surfaces!

Hot parts and the flue pipe can cause serious burns!

- ❒ Always wear protective gloves when working on the boiler.
- ❒ Only operate the boiler using the handles provided for this purpose
- ❒ Insulate the flue gas pipes and avoid touching them during operation

Before carrying out maintenance work on/in the boiler:

- ❒ Press and hold this button for 5 seconds
  - ➥ The controller follows the shutdown procedure and starts with the cleaning cycle
  - ➥ After the cleaning cycle the boiler goes to the operating status, “Cleaning possible”

WARNING

Opening the combustion chamber door during operation!

This may cause injury, damage and smoke!

It is forbidden to open the doors behind the insulating door during operation!

WARNING

Use of non-permitted fuel!

Non-standard fuels can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases / flash fires) which can lead to serious accidents!

Only use fuels specified in the chapter on “Permitted Uses” in these operating instructions.

2.9 Emergency procedure

2.9.1 System overheating

If the system overheats in spite of the safety devices, proceed as follows:

- ❒ Keep all the doors on the boiler closed.
- ❒ Turn off the boiler by pressing the button for 5 seconds
  - ☞ Under no circumstances use the main switch!
- ❒ Open all mixer taps and switch on all pumps.
  - ☞ Fröling heating circuit control takes over this function in automatic operation.
  - ☞ When using a third party controller, carry out the relevant measures to activate the mixer and pumps manually.
  - ❒ Exit the boiler room and close the door
  - ❒ Open any available radiator thermostat valves

If the temperature does not drop, inform the installer or Fröling customer services:

2.9.2 Smell of flue gas

DANGER

Smell of flue gas!
Flue gases can cause fatal poisoning!

- ❒ Keep all the doors on the boiler closed.
- ❒ Turn off the boiler by pressing the button for 5 seconds
  - ☞ **Under no circumstances use the main switch!**
- ❒ Ventilate the installation room
- ❒ Close the door of the installation room or boiler room and doors to living areas

3 Operating the system

3.1 Assembly and initial startup

Assembly, installation and initial startup of the boiler must only be carried out by qualified staff, and these procedures are described in the accompanying assembly instructions.

➲ See TX assembly instructions

NOTICE

☞ **Optimum efficiency and efficient, low-emission operation can only be guaranteed if the system is set up by trained professionals and observing the standard factory settings.**

Take the following precautions:

❒ Initial start-up should be carried out with an authorised installer or with Fröling customer services.

3.2 Filling / refilling the store with fuel

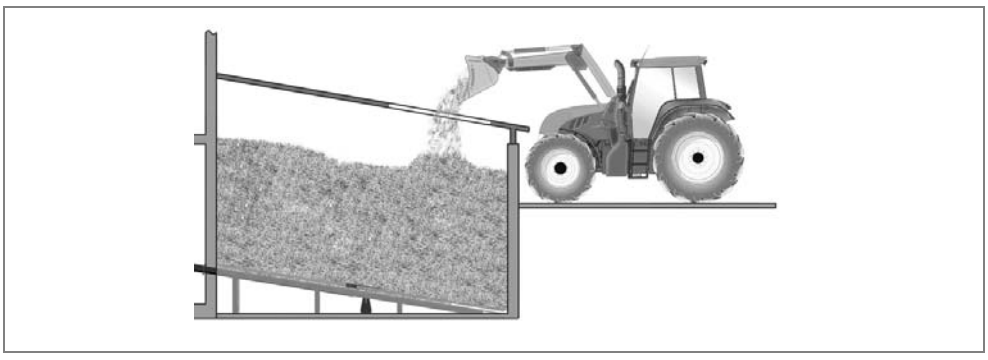
When you fill the store you should always ensure that you are using the right fuel:

➲ Page 9, 2.2.1 Permitted fuels

Caution:

Depending on the fuel and the fill level, different procedures must be followed for filling the fuel store.

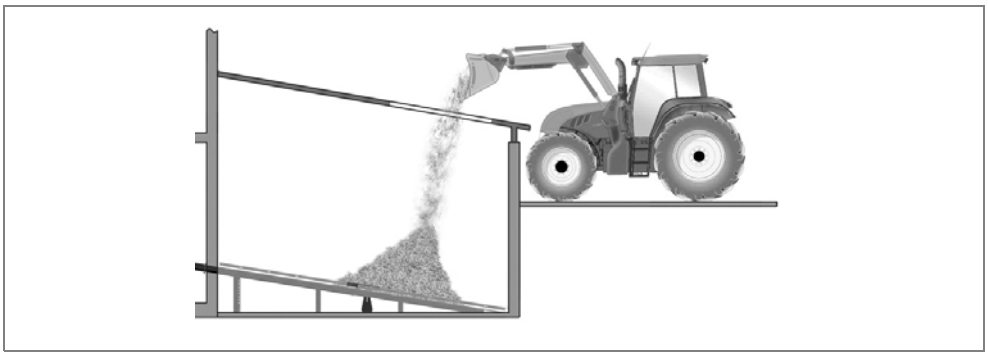
3.2.1 Loading wood chips in a partially emptied store



If there is still sufficient fuel in the store (the head of the stirrer is completely covered with fuel), the store can be filled:

❒ Load the fuel at the filling opening

3.2.2 Loading wood chips in an empty store

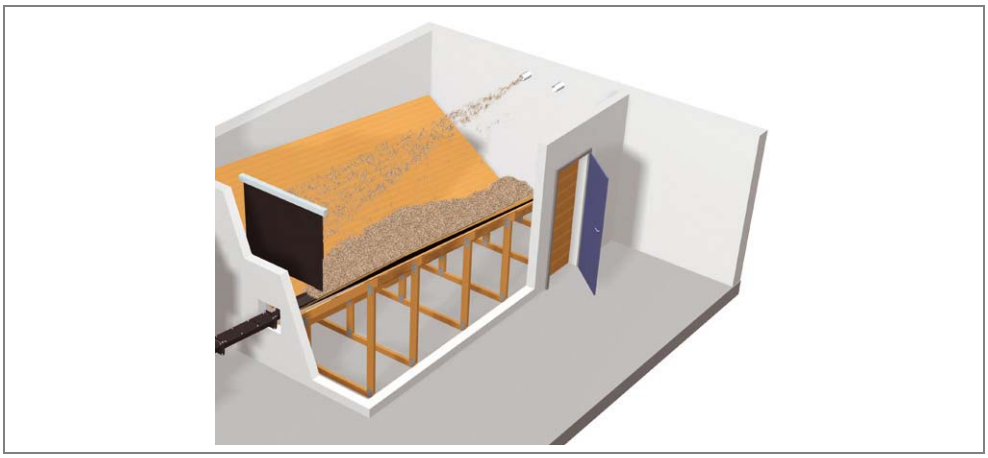


☞ **CAUTION! If the head of the stirrer is already free of material and the arms / spring blades are extended, then the feeder unit must be active during the filling process.**

❒ Press and hold this button for 5 seconds
➥ “Extra heating” mode is activated

❒ Load a small quantity of wood chips and wait at least half an hour (preferably an hour) until the arms / spring blades are touching the head of the stirrer
❒ Only then should you load the remaining material

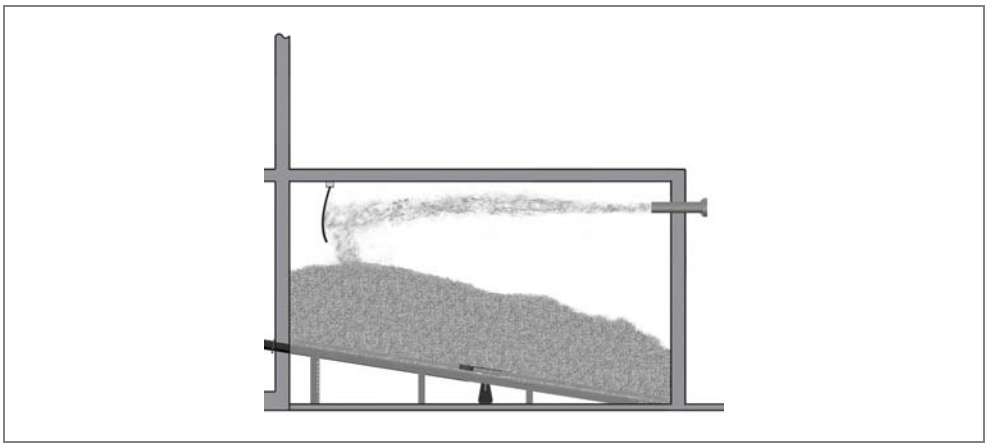
3.2.3 Blowing in pellets for a store with pellet screw



For systems with a pellet screw, the boiler must be in “OFF” status when the store is filled. The under-pressure from the blowing could bring smoke back into the store.

❒ Switch off the boiler by pressing the button for 5 seconds and allow it to cool down for at least two hours.
❒ Close all openings to the store to seal out dust
❒ Blow the fuel into the store

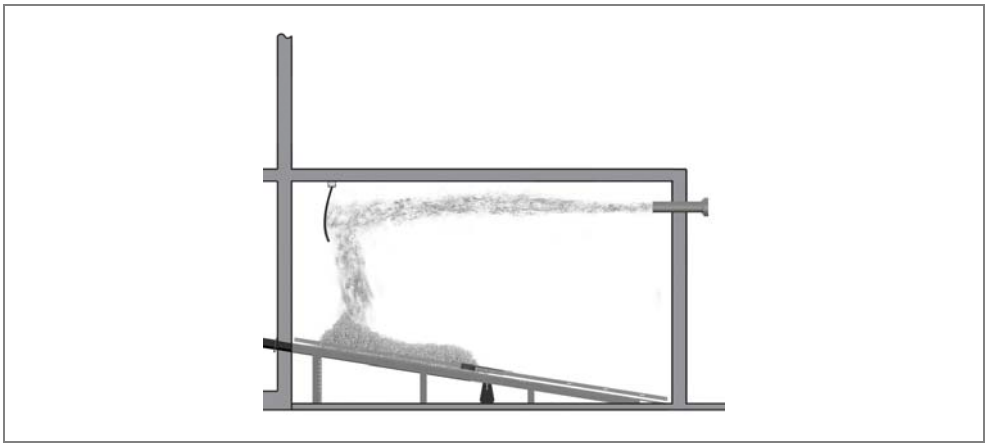
3.2.4 Blowing in pellets for a partially emptied store with stirrer



If there is still sufficient fuel in the store (the head of the stirrer is completely covered with fuel), the store can be filled:

- ❒ Switch off the boiler by pressing the button for 5 seconds and allow it to cool down for at least two hours.
- ❒ Close all openings to the store to seal out dust
- ❒ Blow the fuel into the store

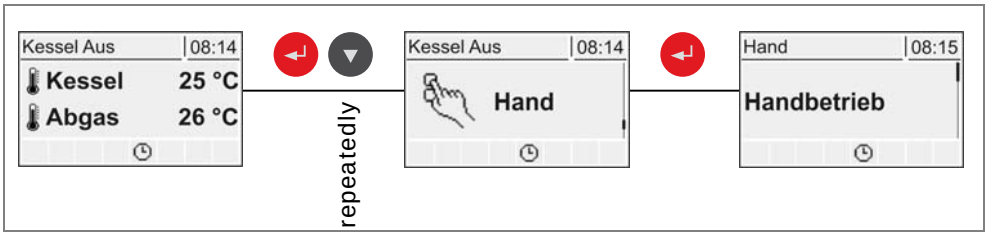
3.2.5 Blowing in pellets for an empty store with stirrer



☞ **CAUTION! If the head of the stirrer is already free of material and the arms / spring blades are extended, then the feeder unit must be active during the filling process, however the boiler must be in "OFF" status.**

- ❒ Turn off the boiler by pressing the button for 5 seconds and allow it to cool down for at least two hours
- ❒ Close all openings to the store to seal out dust

❒ Call up the “Manual operation” menu



❒ Activate the following units in the order shown:

- Ash screw	ON
- Grate tip drive	ON
- Stoker	FORWARD
- BBF manual	ON (or Rotary valve ON)
- Oufeeder - manual	FORWARD

❒ Blow the fuel into the store

❒ After about 5 minutes deactivate the parameter, “Outfeeder - manual”, and the parameter “BBF manual” or “Rotary valve”

❒ Wait until the stoker is completely emptied, and only then deactivate the parameter, “Stoker”

☞ If there is a fuel residue in the stoker, there is a danger of a flash fire the next time the boiler is started, due to a excessive infeed quantity.

❒ Wait until all the pellets in the retort have been transported to the ash bucket, and only then deactivate the parameter “Ash screw” and the parameter “grate tip drive”

❒ Remove all the pellets remaining on the grate from the combustion chamber

☞ If there is fuel residue in the boiler, the chamber can be damaged the next time the boiler is started.

❒ Empty the ash bucket after the end of the procedure

☞ If there is fuel residue in the ash bucket, there is a danger of fire.

3.3 Heating the boiler

3.3.1 Switching on the system

❒ Turn the main switch on the side of the switch cabinet to the “ON” position

➥ After the system check by the controller, the system is ready for operation

➥ “Boiler Off” is shown on the display

3.3.2 Switching on the boiler

❒ Press this button

➥ Automatic mode is activated

➥ The heating system is controlled via the controller according to the selected mode.

3.3.3 Controlling the boiler

➲ See the operating instructions for the Lambdatronic H 3200

3.3.4 Switching off the boiler

❒ Press and hold this button for 5 seconds

➥ The boiler follows the shut-down program and switches to “Boiler OFF” status.

➥ The combustion unit is switched off, the chamber discharge unit and the active hydraulic system are active

3.3.5 Switching off the System

☞ **CAUTION! Only when the boiler is cold, in “Boiler Off” status!**

❒ Switch off the main switch on the controller

➥ The controller is switched off

➥ The components powered via the switch cabinet are powered down

☞ The expansion switch cabinet, which has its own power supply, is still live!

4 Boiler maintenance

4.1 General information on maintenance

DANGER

Working on electrical components
Risk of serious injuries from electric shocks

❒ Work on electrical components should only be carried out by authorised technicians

WARNING

Servicing when the boiler is switched on or hot:

Serious injuries from automatic startup of the boiler and serious burns on hot parts and on the flue gas pipe are possible!

❒ Only carry out work on the boiler when the main switch is turned off
❒ Always wear protective gloves when working on the boiler.
❒ Only operate the boiler using the handles provided for this purpose

Before maintenance work:

❒ Turn off the boiler with the key and allow it to cool down
❒ When the boiler has cooled down, switch it off with the main switch and secure so that it cannot be switched on again

WARNING

Non-permitted cleaning and maintenance!

Incorrect or insufficient cleaning and maintenance of the boiler can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases / flash fires) and this can lead to serious accidents and damage!

Only clean the boiler when it is in “Boiler Off” operating status and in accordance with the instructions. Follow the boiler operating instructions.

4.2 Inspection and cleaning

☞ Regular cleaning of the boiler extends its life and is a basic requirement for smooth running based on output. So clean the boiler regularly!

☞ Recommended: When cleaning, use an ash vacuum.

4.2.1 Inspection

Checking the thermal discharge safety device

❒ Check the seal of the discharge valve at regular intervals

➥ The discharge pipe must not drip

☞ Exception: boiler temperature > 95 °C

If water is dripping from the discharge pipe:

❒ Clean the discharge safety device or have the installer replace it if necessary

Check safety valve

❒ Check the safety valve as per the manufacturer's instructions.

➲ See the operating instructions of the safety valve

Check the system pressure

❒ Read off the system pressure on the pressure gauge

➥ The value must be above the pre-stressed pressure of the expansion tank by 20%

➲ Expansion tank operating instructions

If the system pressure decreases:

❒ Top up the water

☞ If this occurs frequently, the seal of the heating system is faulty! Inform your installer!

In case of large pressure fluctuations:

❒ Have the expansion tank checked

Check the geared motors

❒ Carry out a visual inspection of the seal on the geared motors of the stoker screw and ash screw

➥ There must not be a large quantity of lubricant coming out.

☞ If a few drops of lubricant are coming out, this can be normal. If a lot of lubricant is being lost, inform your installer or Fröling customer services.

4.2.2 Cleaning

Notice -> Main switch OFF

Only check the ash level when “Boiler OFF”

Empty the ash container retort

The ash containers must be emptied at the correct intervals according to energy requirements and fuel quality.

- ❒ Remove the ash container cover and check the level
- ❒ If the ash container is full, unscrew the wing nuts on the discharge flange

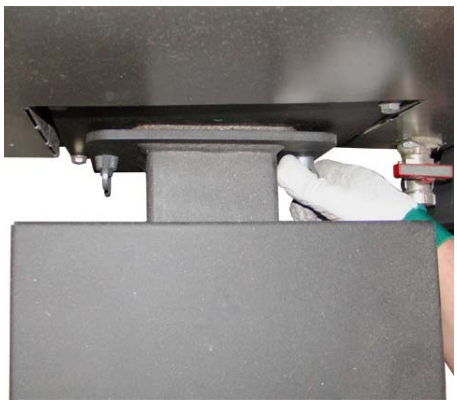
- ❒ When removing the ash container, insert the transport handle and secure with a split pin
- ❒ Separate the ash container and take it to the ash disposal point

Empty the heat exchanger ash container

For heat exchanger with ashcan:

- ❒ Remove the star-shaped screws of the ashcan
- ❒ Take out the ashcan and remove the ash

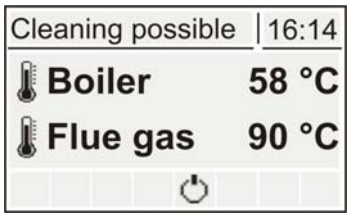
For heat exchanger with ash screws:



- ❒ Remove the ash container cover and check the level
- ❒ If the ash container is full, unscrew the wing nuts on the flange
- ❒ Separate the ash container and take it to the ash disposal point

4.2.3 Monthly inspection

Activate service mode



For cleaning tasks in the boiler activate service mode:

❒ Press and hold this button for 5 seconds
➥ The controller follows the shutdown procedure and starts with the cleaning cycle
➥ After the cleaning cycle the boiler goes to the operating status, “Cleaning possible”
➥ The tipping grate remains in open position

❒ Switch off the main switch

Clean the combustion chamber and combustion space

❒ Open the insulated doors and heat exchanger door
❒ Remove a lot of ash from the combustion space with a shovel
❒ Clean the combustion chamber sensor with a soft brush

❒ Clean the side walls of the combustion space with the furnace tool
❒ Bring the remaining ash down into the combustion chamber below with the furnace tool

- ❒ Close the heat exchanger door and open the combustion chamber door
- ❒ Remove a lot of ash with a shovel
- ❒ Clean the step grate and sloping plates with the furnace tool

- ❒ Clean the side walls of the combustion chamber with the furnace tool
- ❒ Clean the primary air openings in the step grate and sloping plates with a suitable tool (screwdriver or similar)

After cleaning the combustion space and the combustion chamber:

- ❒ Close the boiler doors and insulated doors
- ❒ Switch on the main switch
  - ➥ The tipping grate closes and the controller switches to “Boiler Off” mode.
- ❒ Switch off the main switch again and open the doors
- ❒ Check the cleanliness of the tipping grate once more in closed position and clean the air openings with a suitable tool (screwdriver or similar)

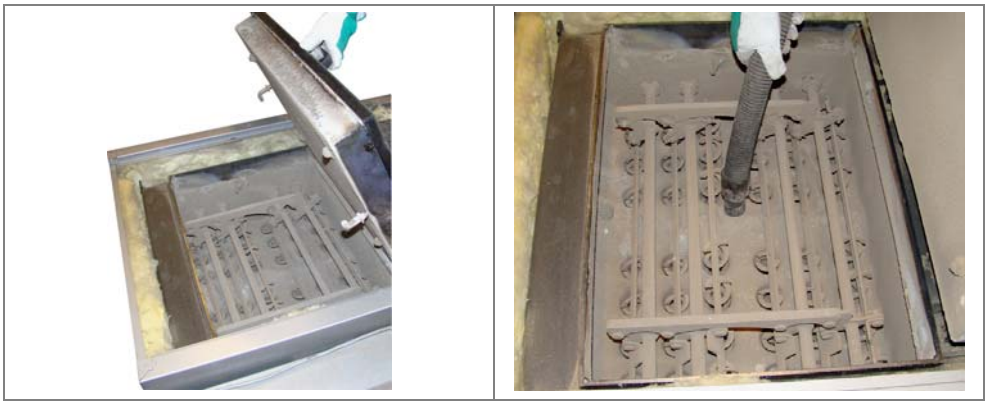
4.2.4 Annual inspection

☞ Carry out annually, however at least after 2500 service hours!

For the annual inspection:

❒ Switch off the main switch when the boiler has cooled down

Clean the heat-exchanger



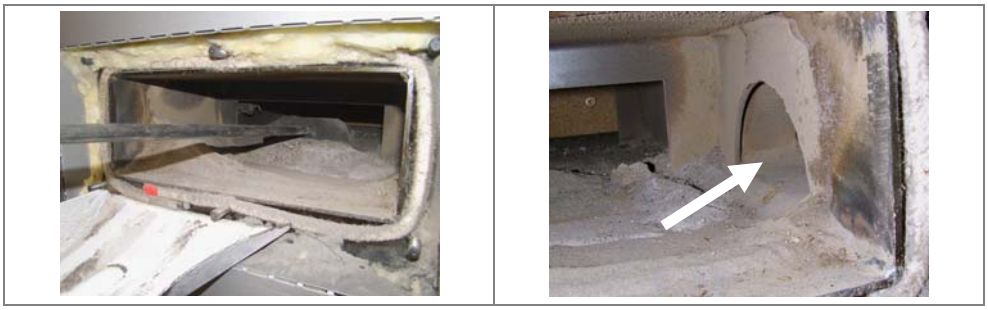
❒ Remove the insulated cover and open the cleaning cover

❒ Remove all dirt and deposits for the flue gas chamber.

Clean the area below the step grate

❒ Remove the blanking plate and the thermal insulation

❒ Remove the inspection cover



❒ Clean away the ash below the step grate with the furnace tool or an ash vacuum

❒ Clean the side passage to the flue gas recirculation (optional)

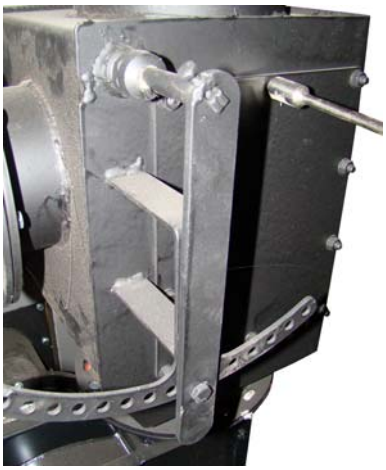
Clean the flue gas recirculation (FGR) (optional)

- ❒ Remove the pipe insulation from the inspection cover.
- ❒ Remove the inspection cover and clean the pipes of the flue gas recirculation unit with a brush

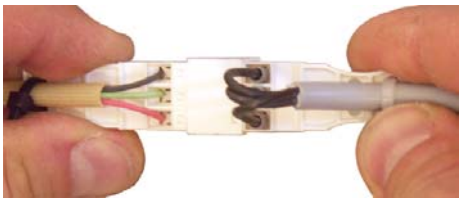
After cleaning the pipes:

- ❒ Remove the inspection cover of the flue gas recirculation box
- ❒ Clean the interior with an ash vacuum

- ❒ Remove the inspection cover of the flue gas recirculation air box
- ❒ Clean the interior with an ash vacuum



Clean the induced draught fan



❒ Remove both cables from the induced draft fan

❒ Mark the flange position and loosen the screws on the fan flange
❒ Take out the induced draught fan and clean the blower wheel with a brush.
❒ Clean the interior of the induced draught fan housing with an ash vacuum

Clean the combustion air blower fan

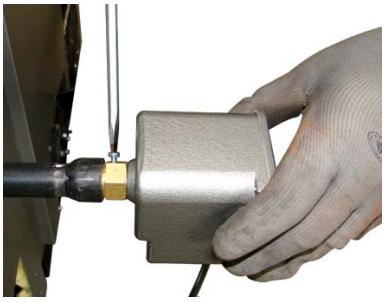
❒ Clean any dust and deposits from the protective grating
❒ Dismantle the protective grating and clean the fan with a soft brush where necessary.

Check the under-pressure controller

❒ Remove the silicon tube from the differential pressure transducer.
❒ Using compressed air, blow out the hose in the direction of the combustion chamber to remove any deposits.
❒ Connect the silicon hose at “Minus”.

Check the combustion chamber overpressure sensor

- ❒ Loosen the retaining screw.
- ❒ Pull the combustion chamber overpressure sensor out of the spacer pipe.
- ❒ Clean the sensor with a fine cloth.
- ❒ Check that the spacer pipe is free.
- ❒ Insert the combustion chamber overpressure sensor and fix gently with fixing screws



Check door seals

- ❒ Check that the ceramic fibre seal of the combustion chamber door, the heat exchanger door and the heat exchanger cover is positioned correctly on the frame
  - ➥ Check the imprint on the ceramic fibre seal.

If the imprint of the seal is broken:

- ➥ The seal is no longer efficient.
- ❒ Adjust the door fastenings or replace the glass fibre seal

☞ After adjusting the combustion chamber door and the heat exchanger door, you must check that the door contact switch is working and if necessary it must be reset.

Check the draught controller flap and explosion flap

- ❒ Check the draught controller flap and explosion flap for ease of operation
  - ➥ If they cannot move smoothly, have them replaced immediately.

4.3 Instructions for measuring emissions

4.3.1 Measurement at rated load

❒ Ensure the highest possible heat consumption:
- Ensure that heating pumps are switched on
- Open mixer valves and radiator valves
- Set the boiler loading time to the current time
- Set the boiler temperature setpoint to 85°C

☞ Chimney sweep mode takes over this function

Activate chimney-sweep mode

❒ Press this button

➥ The chimney sweeper program for boiler measurement is started. The system is operated for 45 minutes at rated load. For this purpose the maximum boiler temperature, the maximum heating circuit flow temperature and the DHW tank loading are released.

When is it possible to measure:
- Flue gas temperature at approx. 140°C
- O_2 content of the flue gas between 8 and 12% (corresponds to a CO_2 content between 13 and 19%)
- Boiler temperature above 65°C

4.3.2 Measurement at partial load (if necessary)

❒ Ensure heat consumption:
- Ensure that heating pumps are switched on
- Open mixer valves and radiator valves
- Set the boiler loading time to the current time

❒ Force partial load:
- After measuring at rated load, lower the boiler temperature setpoint by 5°C

When is it possible to measure:
- Flue gas temperature at approx. 120°C
- O_2 content of the flue gas between 10 and 14% (corresponds to a CO_2 content between 11 and 7%)
- Boiler temperature above 65°C

☞ After measurement all adjusted parameters (e.g. DHW tank loading times, ...) must be reset to their original value!

4.4 Maintenance agreement / Customer service

☞ Long service life with a service agreement!

Regular maintenance and servicing by a heating specialist will ensure a long, trouble-free service life for your heating system. It will ensure that your system stays environmentally-friendly and operates efficiently and cost-effectively.

For this reason, FRÖLING offers a service agreement, which optimises operating safety. Please see the details in the accompanying guarantee certificate.

Your Fröling customer service office is also glad to advise you.

4.5 Replacement parts

With Fröling original replacement parts in your boiler, you are using parts that match perfectly. As the parts fit together so well, installation times are shortened and lifespan is maintained.

NOTICE

Installing non-original parts voids the guarantee!

❒ Only replace components or parts with original replacement parts

5 Troubleshooting

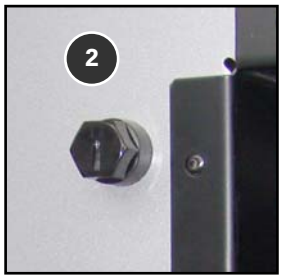
5.1 General faults in power supply

Error characteristics	Cause of error	Error correction
Nothing is shown on the display **No power to the controller**	• General power failure • FI circuit breaker or line protection is switched off • Main switch is turned off • Faulty glass tube fuse in the controls	❒ Switch on the FI circuit breaker or line protection ❒ Switch on the main switch ❒ Switch off the main switch ❒ Replace fuse – note current (e.g. 10A) ❒ Switch on the main switch

5.1.1 System procedure following power failure

When the power supply has been restored the boiler returns to the previously specified mode and is controlled according to the specified program.

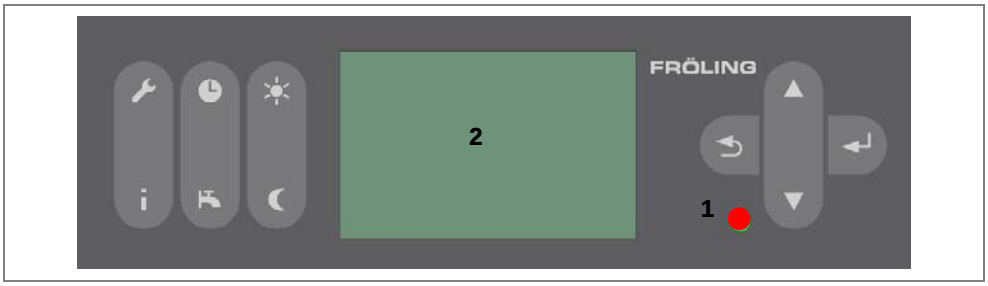
5.2 Excessive temperature



The safety temperature limiter (STL) shuts down the boiler when it reaches a temperature of max. 105°C. After the boiler has cooled down, the safety temperature limiter must be manually unlocked:

❒ Unscrew the cap on the safety temperature limiter (2)
❒ Reset the safety temperature limiter by pressing with a screw-driver.
❒ Replace the cap

5.3 Faults with fault message



If a fault has occurred and has not yet been cleared:

➥ Status LED (1) flashes red

➥ A fault message is shown on the display (2)

An internal distinction is made between 2 types of message:

Warning	Boiler follows shutdown procedure
Error	Boiler shuts down immediately, heating circuit controller and pumps remain active

5.3.1 Procedure for fault messages

The procedure in case of fault message, the causes for faults and procedure for troubleshooting are described in the operating instructions for the boiler controller:

➲ See the operating instructions for the Lambdatronic H 3200

5.3.2 Acknowledging a fault message

Trace and remove the fault and then:

❒ Press this button

➥ Status LED flashes green